PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	William J. Farrell, Jr.	Confirmation No.: 7235
Serial No.	:	10/696,583	Examiner: William V. Gilbert
Filed	:	October 30, 2003	Group Art Unit: 3635
For	:	WIRE MESH SCREED	

DECLARATION OF MARK D. HEATH UNDER 37 C.F.R. 1.132

1. I, Mark D. Heath, am over 18 years of age and competent to make this Declaration.
2. I am an expert in the field of building construction and am a consultant for MetRock LLC, the owner of the above-identified patent application.
3. I have over 30 years of experience in the field of construction. A copy of my personal vitae detailing my qualifications and experience is attached hereto as Exhibit A.
4. After a review of the last Office Action and rejection of the MetRock claims in view of Rockstead, Chen, Strand, Sacks and Ritter, I would like to offer my professional and expert opinion as to the novel and non-obviousness of the MetRock claims.
5. It seems to me that the fundamental and core problem in the rejection of the claims is the lack of appreciation for the novelty of the "screed" element in the MetRockSCIP Panel face mesh. Secondarily there is a lack of appreciation for the structural composite action of the two shells in the MetRockSCIP Panel art.
6. In the paragraphs below I will provide some initial background information to aid in understanding the invention and the novel aspects of the screed element and then provide a detailed discussion of the prior art references and

their inapplicability in rendering the claims unpatentable when viewed from the perspective of one of ordinary skill in the art.

7. The MetRockSCIP panel is what is known in the art as a "SCIP panel" or a Structural Concrete Insulating Panel (SCIP). A SCIP is a composite panel with an insulating core, which, in the case of MetRockSCIP, is a core of EPS (expanded polystyrene plastic) foam. The insulating core is then enveloped with a reinforcing cage. In the case of the MetRockSCIP the reinforcing cage is a welded wire truss with a welded wire face mesh and the two, the truss and the face mesh elements, being held together with mechanical fasteners, specifically wire C-rings. This panel assembly, of the insulating core and the reinforcing cage, is then finished with a cementitious skin, or shell, on each face. Because of the nature of the wire mesh face and the positioning of the mesh and the truss, which causes the welded-wire face mesh to be centered in the cementitious shell, the final panel is able to behave in a composite manner. In other words, because the face mesh and the cords and web ends of the truss are anchored in the two shells, the wire reinforcing cage allows the two shells to work together, fundamentally placing one shell in compression while the other goes into tension, and the whole is a composite panel, with all the parts working together to bring about the resultant structural behavior.

8. The behavior of the panel is somewhat analogous to the behavior of steel "I-beams" or wide-flange beams. The web connects the flanges of the beam to each other and the whole is able to act as a composite, with overall better structural behavior far greater that any or all of the parts could demonstrate acting alone. Similarly, in the MetRockSCIP panel, the shells are connected to each other by the truss, thereby allowing all to work together. The mesh reinforces the shells and better anchors the truss in the shells. The core allows for easy fabrication of the shells and prevents the panel from becoming

a solid mass of concrete, which would change it from a composite shell panel to a simple solid concrete panel, which would greatly reduce the structural performance of the panel.

9. Fundamental to SCIP panels is the known behavior of concrete beams and columns. It is well known and documented and is the fundamental concept behind all concrete beam and column engineering that the forces in a concrete column and beam move to the outer surface of the member, leaving the center of the member with little to no force in it. A typical design drawing of a concrete beam will show a wave passing from the top of the member to the bottom of the member and back, for the length of the member. This is to symbolize the compressive force in the top of the member and the tension force in the bottom of the member. As the wave curve passes through the center of the member we commonly speak of it passing through “zero” force or that the center is “quiet” as to forces. From this we understand that the center of the member has very little forces in it, and, hence, the steel reinforcing in a concrete beam or column is at the edge or surface of the member and little to no reinforcing is in the center of the member. The mass of the concrete in the center of the member serves principally to simply hold the outer surfaces to each other so that the loads can be transferred back and forth, as shown in a typical design wave curve.

10. Because beams and columns are typically created through the process of “forming and pouring” there is really no common practical way of eliminating the concrete in the center of the member. It is this fact that is the foundation of the Rockstead art. Further, concrete as a material is best in compression behavior and needs the steel reinforcing bars to do a good job of resisting tension forces. It has long been known that the mass of concrete in the center of the member added much weight to the member and that significant portions of the reinforcing steel added to the columns and beams were there

simply to overcome the added mass of the center volume of concrete. The advent of the SCIP panel, in the late 1960's was a significant advance in concrete construction.

11. The SCIP panel presented a way of making a reinforce concrete member, but without the disadvantage of the large mass of concrete in the center of the member but with a means of still connecting the two outer reinforced surfaces and allowing them to pass their forces back and forth to each other. The idea of placing a lightweight core in the center of a reinforcing matrix which would have sufficient connectivity between the outer surfaces to allow the forces to pass back and forth between each other, while doing so without having the large dense mass of concrete in the center of the member was indeed novel. Various means of making up the reinforcing cage and of placing the core in the center of the panel have been devised and have received patents.

12. Once the reinforcing cage was fabricated with the core being held in the center of the reinforcing cage, the application of the cementitious shells was rarely, if ever, addressed in any prior art. It was simply left to the user to decide on how to accomplish that aspect of the final composite panel. Various means of applying the shells have been employed: placing the cage inside a form and casting the shells by pouring concrete between the form on each face and the core (as in the Rockstead art); hand applying/toweling-on the shell material; spraying with any of the several plaster, air-placed concreting, shotcreting, and guniting methods; have all been used successfully.

13. Over time, the use of air-placed methods has become the predominant method of applying the shell material to the SCIP panel. This means that some method of pumping and spraying with air pressure is used to convey the cementitious material onto the panel. This results in a relatively fast method of getting the material onto the panel and the resulting economy of

this speed is highly desirable. However, there is one very significant drawback to this method – the finished surface of the panel. When spraying the material onto the panel, the material ends up being quite rough and can have significant highs and lows to the surface. This results in the need of skilled craftsmen to smooth out the surface after the spray equipment has applied it. It is well known that the plastering trade is a declining trade in the US, having been nearly totally replaced by the use of gypsum wallboard. Because of this there are fewer and fewer skilled craftsmen who can effectively finish a sprayed wall. It may well be that this single fact is the reason that there are to date no successful SCIP panel enterprises in the US while there are many, many SCIP plants around the world. Every SCIP panel plant ever opened in the US has failed, without exception. Conversely, there are SCIP panel buildings being built daily in Mexico and around the world, where plastering skills are the norm.

14. It is specifically to this issue that the MetRockSCIP panel addresses itself. The deformations in the face mesh of the MetRockSCIP panel allow an unskilled worker to quickly and accurately flatten the sprayed surface of the shell. By simply drawing a flat edged tool, known in the trade as a “rod” or “knife”, along the built-in “screeds” created by the deformations in the MetRockSCIP face mesh, the worker can quickly true up the surface and achieve results approaching the work of a skilled craftsman.

15. I offer the above background because I feel that the US Patent Office Action that rejected the MetRockSCIP claims in view of the offered prior art is not correct. I feel that the Office Action and rejection of the present claims did not take into account the unique application and the unique area of art where the MetRockSCIP panel is found.

16. With respect to the Rockstead patent relied upon in making the rejection, it is noted that the elements 18 and 18a in the Rockstead art are **not** screed

ridges but rather points protruding past the plane of the face mesh. Again, they are “points”; they are not “lines”, or “rows”; what are known in the trade as “screeds”. If one were to try to use these points as screeds and draw a knife or rod along the surface of the Rockstead “points”, elements 18 and 18a, the result would be a bumpy and irregular surface, not a flat and smooth surface.

17. There is nothing in Rockstead that speaks of these elements, 18 and 18a, being used as screeds. The closest hint to a similar function is that they can space the reinforcing cage at a given distance from the face of a cast-in-place form face. But this system does not use spraying techniques and there is no screeding or troweling of the surface. The wet material is poured into the formwork containing the Rockstead reinforcing cage and the liquid material fills the annular space between the core of the Rockstead cage and the formwork on each face.

18. Given the above, the Rockstead patent does not present any form of a “screed”; nothing that would assist an unskilled worker to quickly and effectively use the elements 18 and 18a to flatten the sprayed-on shell surface. In fact, attempting to do so would result in exactly the opposite effect – the surface would be irregular, “bumpy” and unacceptable, both from a structural point of view, since the thickness of the shell would be compromised, and from an esthetics point of view, since the surface would not be the desired smooth wall surface being sought. This is the antithesis of the screed ridges of the present MetRockSCIP art.

19. With respect to the Chen patent relied upon in rejection the claims, it is noted that Elements 32, 34, 36, 38, 50, Elements 232, 233, and Elements 312, 342 are all flush with the surface of the face mesh element of the Chen art. Fundamental to a shell, in reinforced concrete engineering, is that the reinforcing matrix is approximately centered in the shell. If any of the above

Elements in Chen were used as a "screed", a device to guide the rod or knife of the worker to smooth the surface of the shell material, the result would be that the shell would have the reinforcing grid at the **outer** surface of the shell. This would destroy the ability of the shell to act in a structural manner. This would result in a useless composite shell product.

20. One of ordinary skill in the art reviewing Chen would understand that Chen was disclosing a panel where the cage itself, the metal and core elements by themselves, create a structural element. Chen specifically claims any coating on the panel as decorative or fire retardant elements, and not an essential part of the structural behavior of a composite panel. In other words, one of ordinary skill in the art would understand immediately that Chen is not a SCIP panel art reference. Accordingly, Chen does not need, and thus does not teach, a cementitious coating as a vital and essential element in the performance of the Chen art. Without the cementitious shell added to the MetRockSCIP art, there is no composite panel. Chen and the present MetRockSCIP art are not related art. Chen is a structural metal cage with an insulating core, while the present MetRockSCIP claims are directed to a composite panel with cementitious shells as essential and vital parts thereto.

21. With respect to the Sacks patent, it is noted that if only Figures 1, 2, and 3 were looked at in isolation, it may appear that the mesh of Sacks and the present MetRockSCIP art are nearly identical. However, ignoring Elements 22 and 24, is to ignore a fundamental aspect of what Sacks is disclosing to one of ordinary skill in the art. Claim 1 of Sacks includes item 1.d. and the patent specification makes clear that the barrier is an essential element of the Sacks art. Reading the Background and Summary of the Invention of the Sacks patent clearly describes that the problem trying to be overcome by Sacks is that spraying the plaster on the mesh without the barrier would allow the plaster to coat and/or fill the space behind the wire lath assembly. It is

this result that is specifically being addressed by Sacks by the inclusion of the barrier which stops the plaster from passing beyond the barrier. If such a barrier were used in the present MetRockSCIP art, it would destroy the shell in the present art. The barrier serves to provide an excellent stop for the cementitious material being applied, in the case of Sacks, plaster or stucco. This is not a problem when the application is a decorative surface treatment. However, in the present MetRockSCIP art, the application is a structural panel and any interference with the shell being fully developed puts the entire structure at risk and destroys its ability to serve as a structural building panel.

22. One of ordinary skill in the art reviewing the Sacks patent would immediately understand that the Sacks art is lathing; a substructure for a decorative building element, plaster. By stark contrast, the present MetRockSCIP claims are directed to a Structural Concrete Insulating Panel, a composite structural building element. These are two fundamentally, functionally, different building elements. Sacks is a decoration, while the present MetRockSCIP art is the structural essence of the building. Disallowing the screed in the present art because of a similar fold in the Sacks art strikes me somewhat like disallowing a structural bend in a automobile hood (a structural issue) because the upholstery cloth has ribs in it (a decorative issue). Because these elements are so dissimilar in their application, it seems to me inappropriate to presume that one skilled in the art of decorative plaster would be applying that knowledge to the art of engineered structural concrete composites.

23. In addition, the rib in the Sacks art is used in exactly the opposite configuration as the present MetRockSCIP art. The rib, Element 13, is used to stiffen the Sacks lathing mesh; it is not at all used as a "screed". In fact, it is located on the opposite side of the barrier, Element 22, and is entirely inaccessible to the craftsman applying the coating. It could never be used as

a "screed" to aid and guide the worker applying the coating to the lathing member. Sacks is in essence also the antithesis of the present invention. One of ordinary skill in the art would not take the teaching of a rib in a non-structural lathing, used to stiffen the lath, and "hidden" behind the barrier paper, and conclude that it could be turned around and used as an "exposed" screed to aid the finishing of a shell in a structural composite panel. Indeed, Sacks teaches away from any such screed use in a structural composite panel.

24. With respect to the Ritter patent relied upon in rejecting the claims of the present MetRockSCIP art, it is noted that Elements 1,2,3,4,5,6, are all flush, or nearly so, with the surface of the face mesh element of the Ritter art. Fundamental to a shell in reinforced concrete engineering is that the reinforcing matrix is approximately centered in the shell. If any of the above Elements in Ritter were used as a "screed", a device to guide the rod or knife of the worker to smooth the surface of the shell material, the result would be that the shell would have the reinforcing grid at the **outer** surface of the shell. This would fundamentally render the shell a non-structural element, violating the basic concept of a composite structural panel presented by the present MetRockSCIP art.

25. In Figures 16a and 16b of Ritter there is shown Element 15 and 15', which are positioned outside of the plane of the shell reinforcing grid. However, if this element were to be used as a screed, it would result in the Element 15 and 15' being generally exposed at the surface of the shell, or cemetituous coating, which would produce a surface that would be unacceptable both in appearance and in function. In appearance because the wires would be exposed and in function because the exposed wires would be subject to rapid oxidation (rusting). Also, the elements 15 and 15' are another layer of reinforcing grid, generally planar, very similar to the primary reinforcing grid,

Elements 1,2,3,4,5,6, and fundamentally and functionally are not screeds, and certainly do not teach toward any kind of a screed function.

26. While Ritter is in general a SCIP art, and presents a structural panel with some composite action, it is not at all the structural art of the present MetRockSCIP art. The Ritter "truss" element, Element 7, is not a true "truss" as is presented in the MetRockSCIP art. Because the Element 7 of Ritter is a "truncated triangle" it is inherently less strong than the true triangle truss presented in the MetRockSCIP art. This teaches away from the vital concept of the present MetRockSCIP art that the two shells are functioning in a composite manner. Ritter even speaks of the shells being structurally independent. This would tend to teach away from a structural composite panel with built-in screed devices to aid in the finishing of the surface of the structural composite panel by laborers not skilled in finishing the shells.

27. With respect to the Strand patent relied upon in making the rejection, it is noted that the elements 15 and 18 in the Strand art are **not** screed ridges but rather "ridges" protruding past the plane of the plasterboard. Again, they are "points"; they are not "lines", or "rows". They are nothing like what are known in the trade as "screeds". If one were to try to use these points as screeds and draw a knife or rod along the surface of the Strand "points", elements 15 and 18, the result would be a bumpy and irregular surface, not a flat and smooth surface.

28. There is nothing in Strand that speaks of these Elements, 15 and 18, being used as screeds. The function is that they can anchor the plaster to the plasterboard substrate. The points or ridges are buried within the plaster coating and could not be used as a screed because of their location within, and not at the surface of the plaster coating.

29. Given the above, the Strand patent does not present any form of a "screed"; nothing that would assist an unskilled worker to quickly and effectively use the

Elements 15 and 18 to flatten the shell surface. In fact, attempting to do so would result in exactly the opposite effect – the surface would be irregular, "bumpy" and unacceptable, both from a structural point of view, since the thickness of the shell would be compromised, and from an esthetics point of view, since the surface would not be the desired smooth wall surface being sought. This is the antithesis of the screed ridges of the present invention.

30. One other contrast is that the Strand art is decorative plaster. This fact alone would teach away from a structural system with composite acting shells. Further, only in the general description does Strand present the possibility of a plaster coating on both sides of the plasterboard. The claims do not discuss this and the figure does not present this. In the present MetRockSCIP art the two shells are integral and vital to the functioning of a structural composite. Strand is a decorative art and not a structural art and nothing in Strand would teach toward structural applications of elements of the Strand art.

31. As set forth above, I am of the opinion that the prior art does not teach or suggest the claims of the present application. In particular, I am of the opinion that the prior art is devoid of any teaching or suggestion of screed ridges that would allow for unskilled labor to finish the cementitious layers. I am also of the opinion that the prior art relied in the Office Action teaches away from the present invention and would not be understood or used by one of ordinary skill in the art to reach the claimed invention.

I make the following declaration to the best of my personal knowledge and belief with acknowledgement that willful false statements are punishable by fine or imprisonment, or both under 18 U.S.C. §1001 and may jeopardize the validity of any patent issuing thereon.

PATENT

Dated this 28th day of November 2008.

Mark D. Heath

Exhibit A

Mark David Heath

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Summary

Executive level Construction Management skills and capacities founded on Field Management and Trade Craftsman experience.
Especially sensitive to accomplishing the "soft" goals of a project (political, environmental, social, and organizational) while meeting time and budget constraints.

Twenty-nine years of professional experience in all levels and types of Construction Cost Engineering and Construction Management. Extensive experience in the following areas:

- Project Administration and Project Management in Civil, Piping and General Building projects.
- Project Cost Control and Schedule Control in a broad range of construction types - Civil, Industrial Piped Processes, General Building, and Specialty Projects such as Historic Renovation/Restoration and Theme Parks.
- Estimating at all levels - Conceptual, Design Development, Bid and Forensic.
- Education and Instruction in Construction Cost Engineering and Construction Management.
- Cost Estimating and Scheduling Software and Software Systems Development.
- Expert witness and litigation assistance.

Experience

2005 - Present

Operations Director
Norwest Group – Dubai, UAE
International Project Director, Director of Operations for Construction. Directly responsible for day-to-day operations in Chad, Africa for installation of DBST Roads for ExxonMobil venture in Southern Chad. Responsible for technical aspects of work in other countries.

2003 - 2005

Chief Technology Officer
Green Sandwich Technologies - Los Angeles, CA
Development of technology and intellectual property for Structural Concrete Insulating Panels (SCIPs). Secured US Patent #6,718,712 and other Patents Pending. **Developed theory of composite concrete shell behavior, a first in the engineering world.** Prepare training for Fabricators, Installers and Designers.

MAR 88 - 2003

Construction Cost Engineering Consultant
MDH Consulting - Los Angeles, CA

Representative Tasks:

Anheuser-Busch - Business Administrator and Project Controls Manager on Owner's Construction Management Team. Responsible for contracts administration and scheduling / project controls of work at the Los Angeles Brewery as part of the Benchmark Modernization Project. Project value over $500 000 000.

Anheuser-Busch – Field Project Engineer on Owner's Construction Management Team. Owners' Project Manager at the Los Angeles Brewery for several projects, i.e., Ammonia Relief Valving, Condensate Header Replacement, Bio-Energy Recovery Screens, Reverse Osmosis Discharge Sewer. Total Projects valued at over $5 000 000.

Component System Builders, LLC, dba Terra Verde Homes - System Design and Cost Engineering Consultant. Responsible for conceptual design of a system of panelized construction employing steel-reinforced cementitious skins on insulating cores. Assist in securing US Patent rights (Patent # 5,487,248 and #60/127,224). Assist in obtaining worldwide marketing representation. Assist in manufacturing decisions and general business operation decisions.

Calex Engineering Co. - On-Site Project Manager for Mass Excavation and Foundation Contract with UCLA. Responsible for daily direction of the work, contact with the Owners' Representatives and for submittals and schedules. Project value approx. $2 500 000. **Designed and employed world's tallest geo-grid restrained retaining wall to facilitate fast-track foundation construction.**

Dalton Construction - On-Site Project Manager for Compton Multi-Modal Transit Center. Responsible for daily direction of the work, contact with the Owners' Representatives and for submittals and schedules. Project value approx. $2 500 000.

Richardson Engineering Services - Cost Engineering Consultant, with special emphasis in Project Scheduling and Conceptual Estimating. Consultant to national oil companies of Venezuela on Gas Compression Stations and Cross-Country Pipelines. Consultant to Pakistani consortium on relocation of a Cracking and Refining Plant. Consultant to Dutch salt company on construction of new Salt Plant.

STV / Seelye, Stevenson, Value & Knecht, Architects and Engineers. - Consulting Cost Engineer. Responsible for producing and publishing Schematic Design Cost Estimate for Los Angeles County Transportation Commission Central Storage and Maintenance Facility, a "fast-track" commuter rail facility.

NOV 83 - MAR 88

Principal
The Pillar Group, Inc., Los Angeles, California
Responsibilities in three divisions included:

H & W Associates - Cost Engineering, Value Engineering, Computerized Construction Cost Estimating, Scheduling and Construction Management. Designed software and report formats. Developed and implemented estimating methodology. Owner's Construction Manager for UCLA Drew Medical School Addition. **Developed first software programming to perform NAVFAC format estimates on personal computers.**

LamTech - Industrialized Building Technologies. Manufacture and installation of panelized building components. Panels made of gypsum skins laminated to Kraft paper honeycomb core. **Directed research and testing team which acquired a 1-hour fire-rating label - the first in the industry.** Directed field teams employing panels in single-family housing, tenant improvement and background/set construction. **Designed and built world's tallest Permanent Wood Foundation retaining wall.**

Construction Information Institute - Professional Instruction in Estimating and Construction Management.
Administrator, Lecturer. Responsible for general operation of the Institute. Primary responsibility for curriculum development and in-service training of instructors.

JAN 81 - JUN 83

Manager of Estimating

	Tamimi & Fouad Construction Division, Dhahran, Saudi Arabia (TAFCO - A venture spin-off of Guy F. Atkinson, CA) Construction of infrastructure, highway, water and sewage treatment plants, and general building projects. Initiated and successfully installed personal computer assisted estimating system during the summer of 1982. Member of Senior Management Team, growing annual gross sales from $60 to over $100 million.
1979 - 1980	**Estimator** Santa Fe Engineers, Lancaster, California Staff Estimator. Designed and wrote first estimating software to automate company system. Project Engineer. Mobilization team member for Long Beach Regional Post Office and Bay Pines VA Hospital (largest and most automated in the VA system). Armo Construction, Santa Monica, California Staff Estimator
1976 - 1979	**Trade Contractor** Salt Lake City and St. George, Utah Self-employed.
1970 - 1976	**Apprentice / Tradesman** Heath Homes Inc., Kaysville, Utah Apprenticeship in Concrete, Carpentry, Masonry and Drywall

Biographical Synopsis

Nationality:	United States Citizen. Passport No. 034076411
Marital Status:	Married with six children.
Education:	BS Economics. Post Graduate work in Law (2 years; focus on business law).
Memberships:	American Association of Cost Engineers Boy Scouts of America, National Eagle Scout Association
Licenses/Certificates:	Certified Cost Consultant, No. 01289 Certified Professional Estimator, General Construction, No. 584-663 Licensed Contractor: State of California, Classification 'A' & 'B', No. 613221; State of Arizona, Class 'B', State of Utah, Class 'B' Post-secondary Teaching Certificate, Department of Education, State of California
Computer Skills:	Hardware: Apple Macintosh and Windows/MS-DOS environments. Software: MS Project, Success, Timberline, Agtech, MicroPlanner, and MacProject, Primavera.
Foreign Living/Travel:	Chad, Africa – 2 yrs; Saudi Arabia - 3 yrs.; Spain - 2 yrs.; French Canada - 4 mo.; Southern Europe - 3 mo.; South America – 2 mo., Pakistan – 2 mo.
Languages:	Fluency in English and Spanish. Conversational skills in French.